Photo: Mika Kurkilahti

Interreg Baltic Sea Region

Co-funded by the European Union

ENERGY TRANSITION
Climate-4-CAST

Climate work and emission monitoring

Climate-4-CAST Training course in Turku 1.9.2026

Miika Meretoja
Senior Specialist
Climate, Nature, and Circular Economy
City of Turku

This is Turku

- Former capital and oldest city of Finland (AD 1229)
- **210.000** residents and over **325 000** in the region
- 2 universities and 4 universities of applied sciences
- **40 000** students in higher education and **11 000** in vocational
- **City of Culture**, Creative, Maritime, Bio and Diagnostic industries
- Active civic society
- Dense urban structure
- Rich natural environment and **archipelago**

CITY OF TURKU IS A WINNER OF THE

Covenant of Mayors for Climate & Energy EUROPE 2020 Awards

60° 30' 33" N / 22° 12' 45" E

A leading climate and nature city

Carbon neutral 2029 Nature positive 2030 Resource-wise 2040

Mayor's Programme and City Strategy

Sustainable use of natural resources

Bio diversity

Zero waste

Carbon neutral

Covenant of Mayors for Climate & Energy

TURKU ÅBO

SUSTAINABLE DEVELOPMENT GOALS

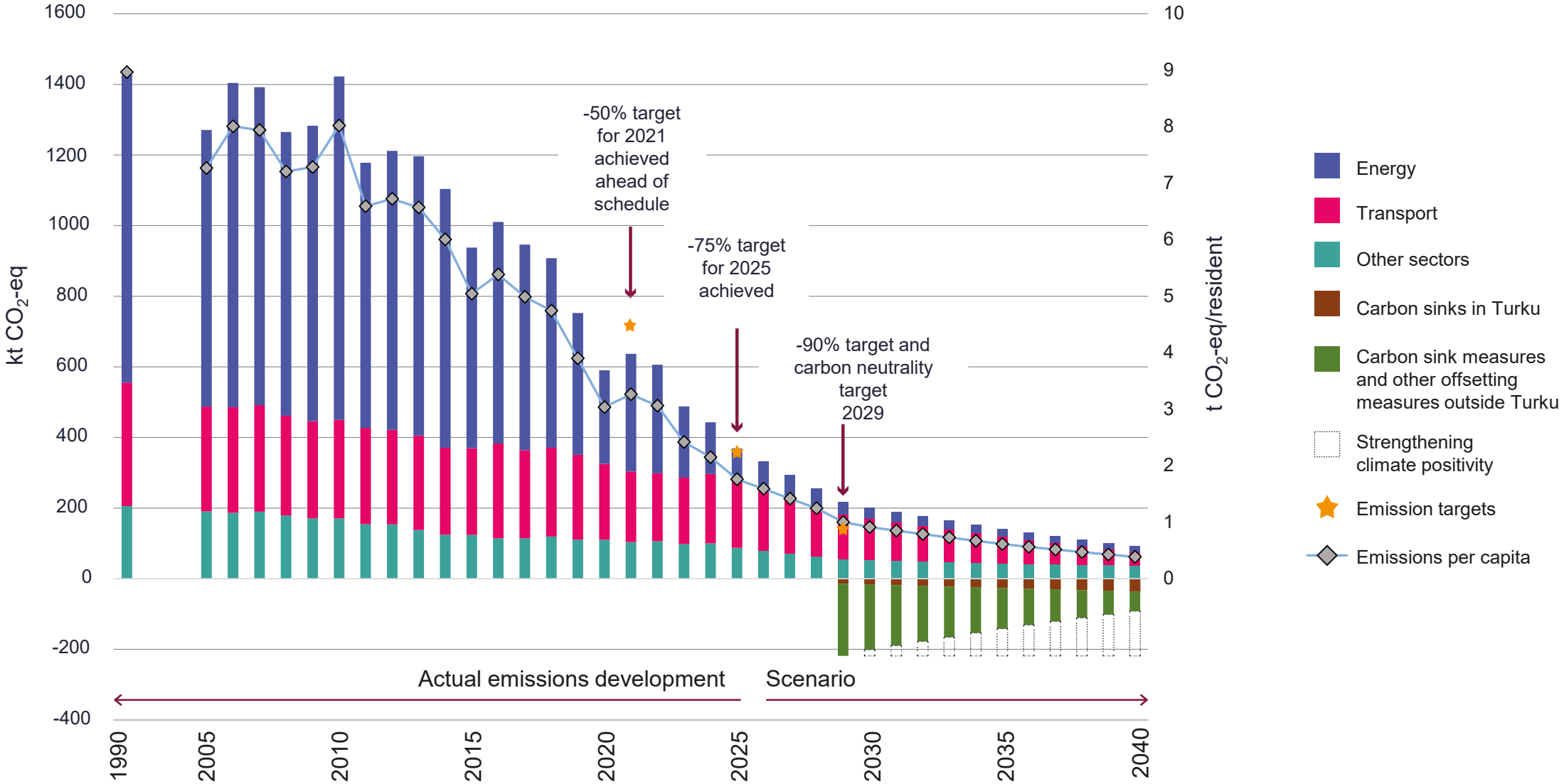
City of Turku supports the Sustainable Development Goals

Guiding principles for climate work in Turku

1. Knowledge-based approach and continuous development
2. Cooperation and collaboration
3. Equity, participation and agency
4. Nature positivity and strengthening carbon sinks
5. Resource wisdom and life cycle thinking
6. Vitality and well-being
7. Resilience, risk management and future sustainability

Photo: Vilma Hilden

Emissions development, scenario and attainability of the target



Scenarios and evidencing attainment of targets

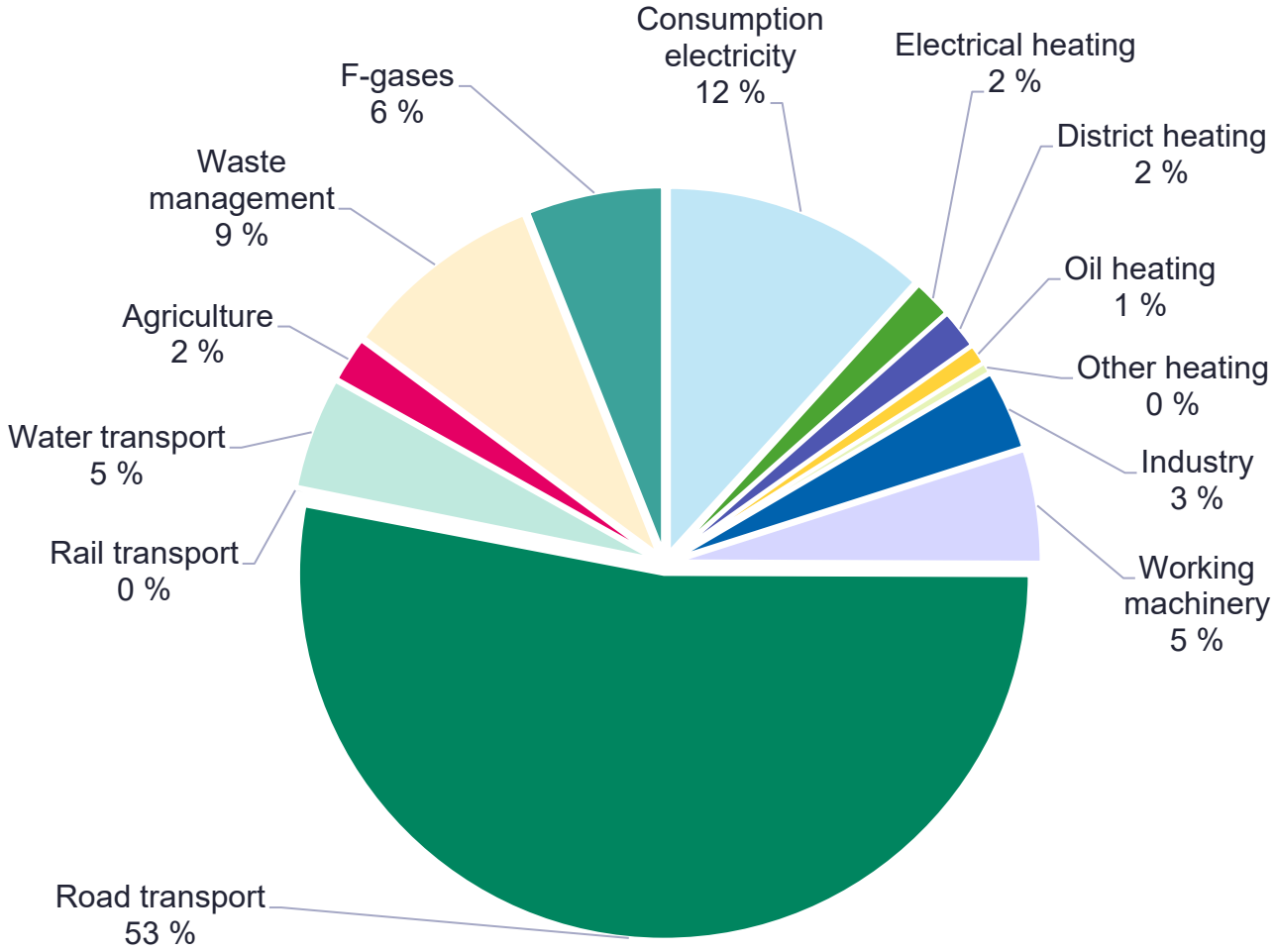
Unless other additional emission reduction measures are implemented, **the scenario will fall short of the 90% emission reduction target set for 2029 by 76 kt CO_2-eq.** New emission reduction measures should specifically target emissions from road transport.

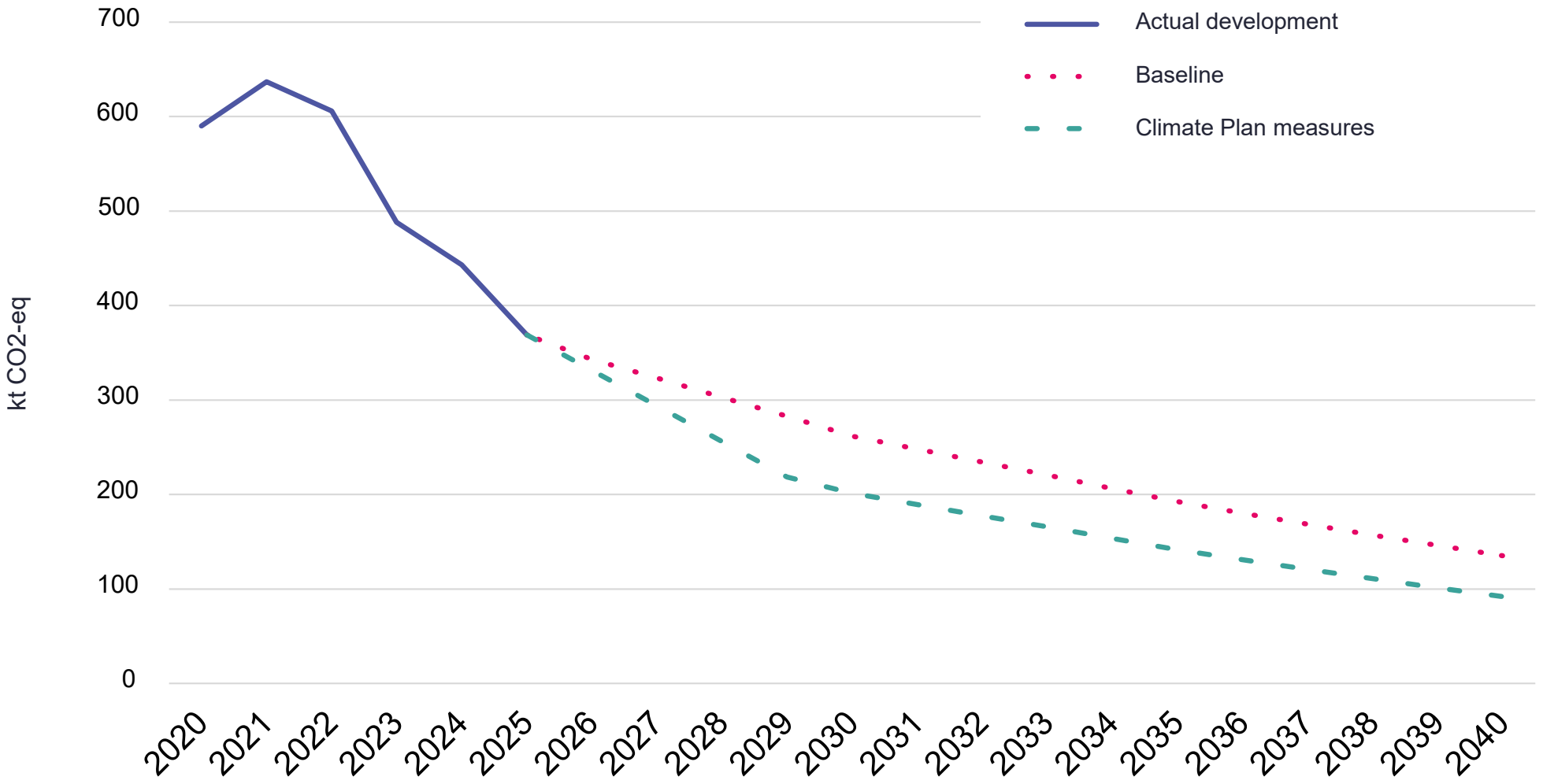
Carbon neutrality can also be achieved without new emission reduction measures **by compensating for the remaining emissions by strengthening carbon sinks and through offsetting measures.**

Turku has been active in strengthening carbon sinks and developing offsetting solutions in wide-ranging cooperation.

A more detailed plan for offsetting residual emissions in the Turku region will be prepared by June 2027 so that a decision on it can be made and implemented starting in autumn 2027.

Projected sectoral distribution of emissions in 2029




700
600
500
400
300
200
100
0
kt CO2-eq
Actual development
Baseline
Climate Plan measures
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040

Residual emissions will primarily be offset in natural carbon sinks located in the Turku urban area in a way that supports nature positivity.

The amount of carbon sinks and carbon offsets required will be approximately 140 kt CO_2-eq if the emission level is 90% lower than 1990 levels. If the emission reduction is not fully realised in line with the target, the required carbon sinks and offsetting measures based on the scenario will be 140-220 kt CO_2-eq.

Photo: Suvi Elo

A 90% emission reduction from 1990 levels

Residual emissions 140 kt CO_2-eq

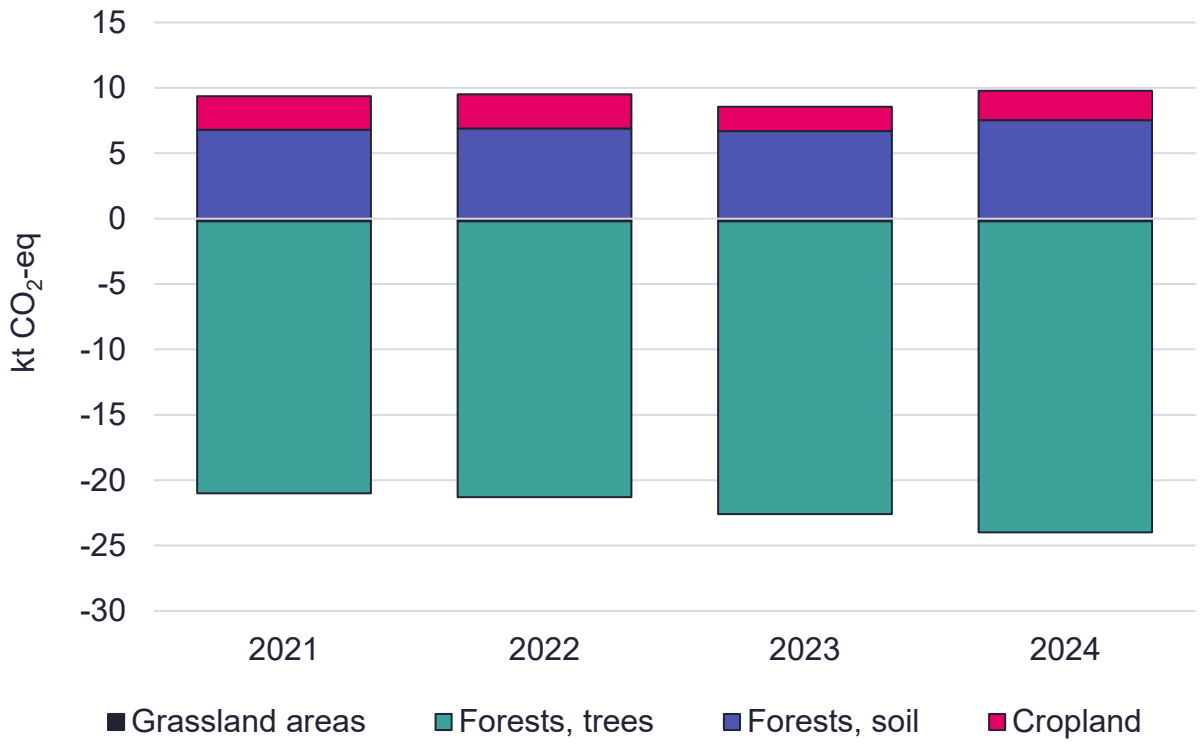
Order of priority

1. Increasing the natural carbon sinks in the urban area in a way that supports the nature positivity target.
2. Additional carbon sink measures in connection with ecological compensation.
3. Implementation of technical carbon sinks in the city area.
4. Implementation of additional carbon sink measures and other offsetting measures outside the City of Turku (municipal cooperation model according to the HINKU criteria).
5. Procurement of certified carbon credits from outside the city.

Strengthening biodiversity

Carbon neutrality → **Climate positivity**

Current state of carbon sinks in Turku and scenarios



The image presents the change in the carbon storages of forests and soils located in the Turku region as well as greenhouse gas emissions caused by cropland and grassland areas.

In total, the size of the sink in the land use sector has been 12-14 kt CO_2-eq in recent years.

The maximum sink potential of the land use sector in Turku is approximately 37 kt CO_2-eq. In order to reach this level, it would be necessary to avoid felling and implement climate measures on cropland.

In order to achieve the carbon neutrality target in 2029, carbon sinks in the Turku urban area and offsetting measures implemented outside Turku must total 140–220 kt CO_2-eq.

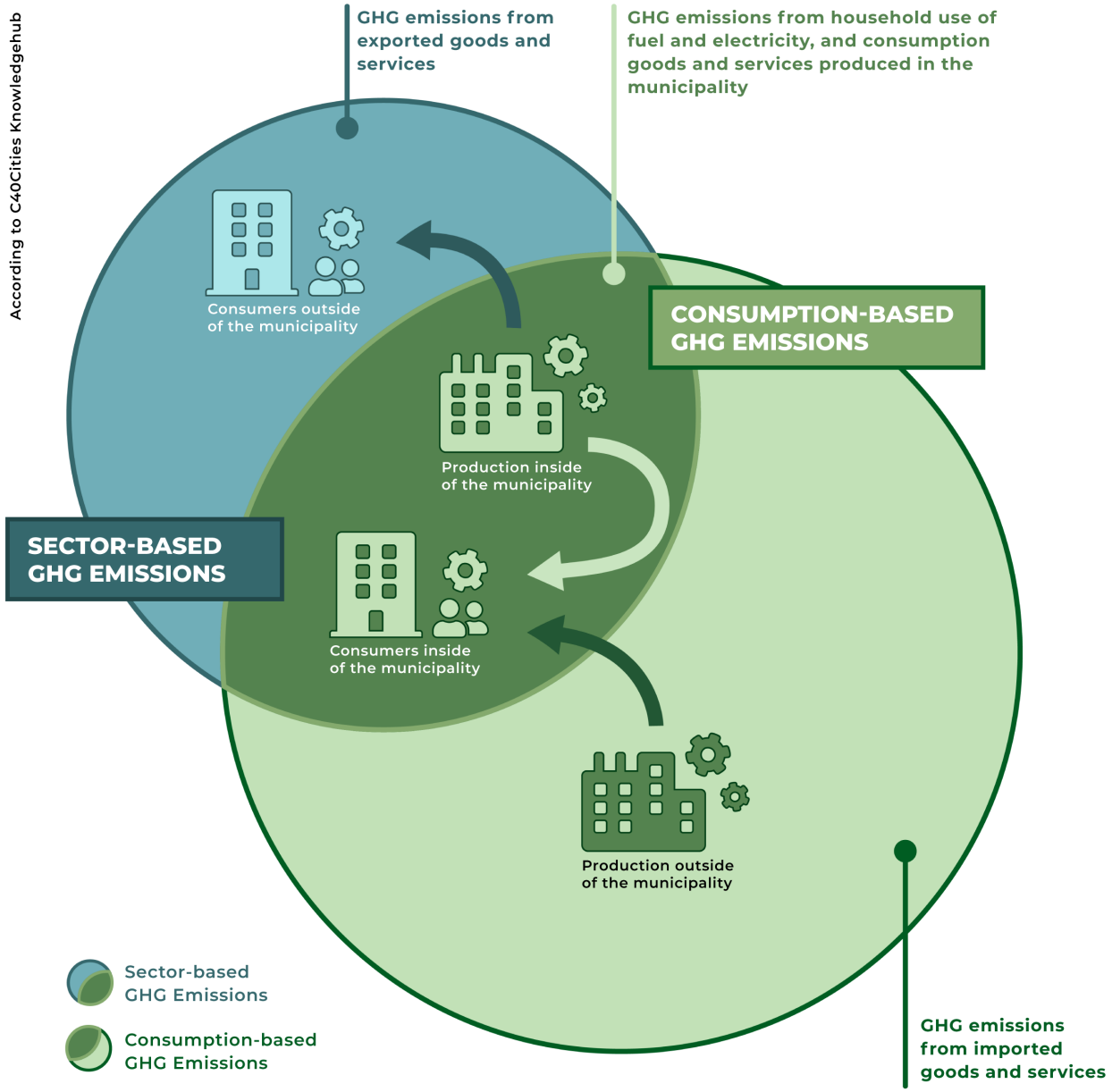
The aim is for natural carbon sinks to cover as much as possible.

Emissions from consumption and targets

Total emissions from consumption in Turku (columns) and emissions per capita (dots) using the ALasKulutus model in 2005, 2015 and 2019 and the Kulma model in 2024.

Specific reduction targets are now being set for emissions from consumption for the first time.

- The city will strive to reduce the emissions from consumption (carbon footprint) in the Turku region in 2026–2035 so that emissions will be halved from 2005 levels.
- By 2040, the aim is to reduce emissions from consumption by 70% from 2005 levels.



Overlaps and differences between consumption-based and sector-based calculations

When talking about municipal greenhouse gas emissions, we often mean greenhouse gas emissions calculated using sector-based, regional, calculation models. Sector-based calculation models mainly cover emissions caused by energy consumption within the municipality and waste management, as well as other emissions occurring within the municipality's geographical area. For example, emissions from agriculture and product manufacturing in the municipality are included in the calculation, regardless of where the products are consumed. When calculating consumption-based greenhouse gas emissions, the calculation includes all emissions caused by the consumption of citizens, regardless of where the consumed goods were produced. For example, emissions from food and goods consumed by citizens are included in the calculation, even if the production of the products takes place outside the municipality's or Finland's borders.

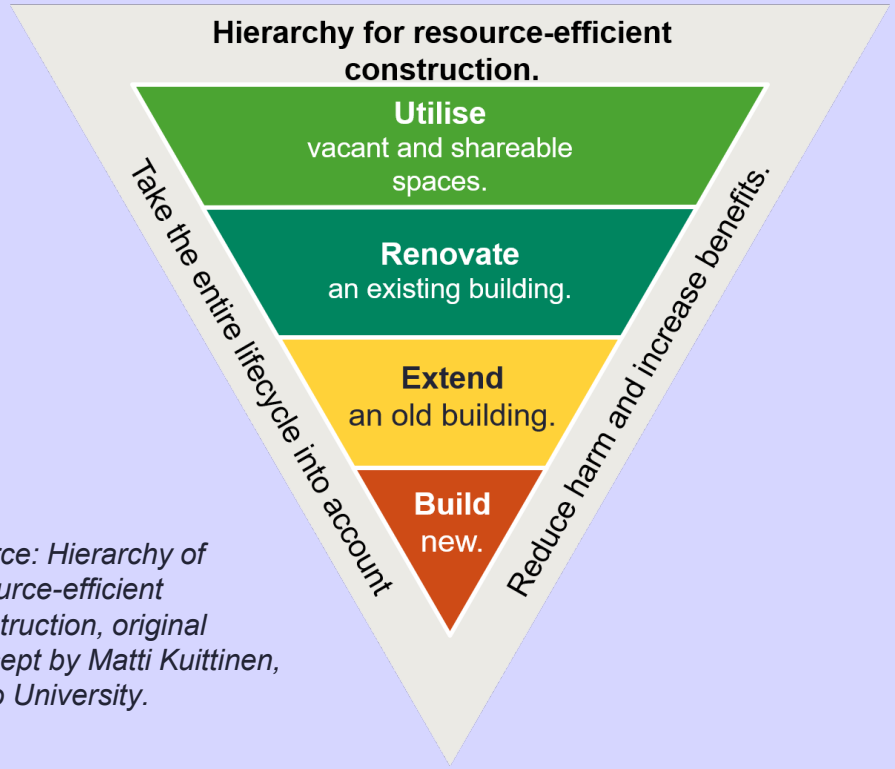
Figure 1: Sector-based and consumption-based emission calculations partially overlap. They are not alternatives to each other but complement each other and together provide a broader knowledge base of greenhouse gas emissions caused by activities of the municipality and its citizens.

Emissions from construction in Turku were 204 kt CO2-eq in 2024

Emissions from construction are examined as part of the calculation of consumption emissions. Construction accounted for 13% in 2024.

The climate and environmental impacts of construction arise from the carbon and nature impacts of the raw materials and the operating methods of the construction phase.

How to achieve low-carbon sustainable construction?



Source: Hierarchy of resource-efficient construction, original concept by Matti Kuittinen, Aalto University.

Effective methods of reducing emissions include promoting the circular economy and low-carbon renovation and new construction in both infrastructure and facility projects.

In Turku, several models are used for monitoring climate impacts.

Photo: Suvi Elo

Scope	Turku (territorial)	Global
Annual emissions (community-scale)	• ALas • CO2-raportti • SECAP	• ALasKulutus • Kulma
Long term forecasts	• Emission scenarios	• LCA for investment projects

The prerequisites for successful climate work are participation, equity and clear communication.


Photo: Joel Karlsson

Communication and public discussion have an impact on the progress of climate measures.


Photo: Miriam Sewon

Participation strengthens the success of climate measures.


Photo: Visit Turku Archipelago

Equity and inclusion are prerequisites for ambitious climate work.

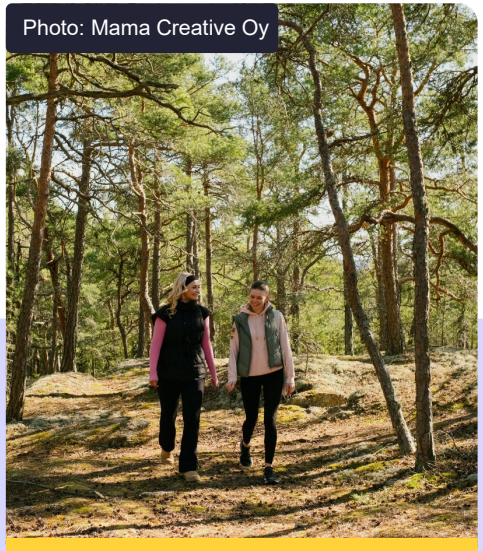


Photo: Mama Creative Oy

Climate communications and climate literacy enable behavioural change.

According to the IPCC Synthesis Report (AR6) published in 2023, participation, equity and clear communication are key prerequisites for successful climate action.

The Boldest city in Finland.

Thank you!
miika.meretoja@turku.fi